

### ABOUT THESE MAPS

Maps a, b and c show the at-sea density (birds/km<sup>2</sup>) of Glaucous-winged Gull (*Larus glaucescens*) in three ocean seasons – Upwelling, Oceanic, and Davidson Current, displayed in cells of 5' latitude by 5' longitude. Densities are based on the combined data sets of several studies; see the Data and Analyses section of this chapter. The color and mapping intervals were selected to show the most structure and highlight significant areas, while allowing comparisons among marine bird species. Cells that were surveyed but in which no Glaucous-winged Gulls were observed have a density of zero. Areas not surveyed appear white; no information was available for these areas. Blue lines indicate the boundaries of the National Marine Sanctuaries in the study area: Cordell Bank, Gulf of the Farallones and Monterey Bay. Bathymetric contours for the 200 m and 2,000 m isobaths are shown in light blue.

In order to provide an integrated look at the patterns of a species' spatial and temporal occurrence and abundance in the study area, map d shows seasonal high-use areas, displayed in cells of 10' latitude by 10' longitude, and also breeding colonies (when available). The seasonal high use map provides a further synthesis of densities presented in maps a, b and c, and portrays the relative importance of various areas to the species. Areas with consistently high use are highlighted. See the Data and Analyses section of this chapter for further explanation of high-use areas.

### DATA SOURCES AND METHODS

The at-sea data set is referred to as the CDAS central California data set (1980-2001) and was developed using software called Marine Mammal and Seabird Computer Data Analysis System (CDAS), by the R.G. Ford Consulting Co. The data set extends from Pt. Arena to Pt. Sal in the study area, and the surveys used were conducted between 1980 and 2001. See the Data and Analyses section of this chapter for more information on the at-sea survey data sets and methods.

### RESULTS AND DISCUSSION

The Glaucous-winged Gull breeds north of the study area, along the coast from Oregon to Alaska. After breeding, it disperses south. The species occurs in the study area during all seasons, but begins arriving in the study area during the Oceanic Season

and peaks in abundance during the Davidson Current Season. Considered uncommon based on CDAS data, surveys recorded 548 sightings of 990 individuals. The species is more abundant in the northern part of the study area, and is represented primarily by subadults, with the majority of adults remaining closer to the breeding areas to the north. A multiple-regression analysis of nine independent variables explained 17.1% of the variance in density with the top three variables for this species being season, latitude, and a negative relationship with ocean depth; see Table 3.8. The latter reflects the fact that the majority of these gulls occur in waters from the shelf to the mid-slope (mean depth of where they occurred was  $461 \pm 61$  m), although some individuals did occur far offshore, well beyond the slope.

The Glaucous-winged Gull is a generalist feeder, taking anything found edible at the sea surface dead or alive. See Tables 3.5, 3.8, 3.9, 3.10 and 3.11 for related summary information.